

5. The pipette assembly as set forth in claim 4 wherein the female tip receiver is funnel shaped to facilitate the receipt of the disposable pipette tip.

REMARKS

In paragraph 2 of the detailed action of the examiner rejected claim 1 as anticipated by US 5,844,686 which discloses a SYSTEM FOR PIPETTING AND PHOTOMETRICALLY EVALUATING SAMPLES. The text of this prior art patent states that "...it is the object of the invention to provide a system for pipetting and photometrically evaluating samples which is more suitable for those analyses, for which the pipette tips are used one time only and are thrown away then." (col. 2, lines 11-15) In applicants invention it is an object "...to provide a pipette assembly employing a disposable tip which may be used with very small samples in the range of 0.1 - 2.0 μ l with a high degree of accuracy." (Page 2, lines 6-9) Thus we have in common disclosures of pipettes having disposable tips, but with totally different objectives in mind. Furthermore, the pipettes disclosed and claimed are substantially different. In addition, other features are also quite different, these features being set forth in new claims 4 and 5.

More particularly, in accordance with the reference patent it is necessary to provide a pipette tip having a one or more windows 8, 9 through which a light beam can project. This requires that the tip be made of an assembly of parts. Furthermore, it can be seen that the disposable tip has a conical portion below the cylindrical portion which receives the window. Because of these design considerations, the tip of the reference patent is not relatively inexpensive, nor is it designed for very small samples. Thus, the tip of the reference patent is not

designed for securing a measured amount of sample, but only a sample sufficient for photometric analysis.

In applicant's design it is desired to secure an accurate small volume in the neighborhood of .5 microliters, for example the volume of a pencil lead of .5mm diameter with a length of 2.5mm. This feature is accomplished by using "a disposable pipette tip formed of extruded plastic tubing, the tubing being snugly received in the female tip receiver of the suction device". It is well known in the art that extruded tubing is quite uniform in diameter, and thus it is quite suitable for securing accurate measurements. In addition, a wire is used for the piston. It is also well known in the arts that wires tend to be quite uniform in diameter. In practice, a wire having a .22mm diameter can be used in an extruded tube with an i.d. only slightly more than 0.22mm.

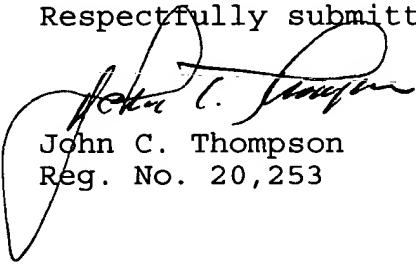
With further reference to claim 1, clearly there is nothing in '686 which discloses "a disposable pipette tip formed of extruded plastic tubing". As the reference patent does not disclose this feature, the examiner is respectfully requested to withdraw the rejection based upon 35 USC 102. Furthermore, there is simply nothing in the prior art which suggests, either by itself, or in combination with '686 that it would be desirable to use a pipette tip formed of extruded plastic tubing. Accordingly, as claim 1 is directed to a feature not taught by the prior art, or which would not be obvious from the prior art, the allowance of this claim is respectfully requested.

New claim 4 is directed to a combination of features which further insures accurate measurements. In the prior art design relied upon by the examiner, a very substantial air volume will exist in the disposable tip. To achieve greater accuracy when withdrawing small amounts of liquid, particularly those with high viscosity, it is necessary to minimize the air which is subjected to vacuum. This is accomplished in applicants design by having

the disposable tip located at the tip of the piston when the latter is extended. This feature, which is now set forth in claim 4, is clearly not taught by the prior art cited by the examiner or of record in this application. Accordingly, claim 4 and dependant claim 5 are also deemed to be allowable.

As all claims in this application are deemed to be allowable over the art cited and applied by the examiner for the reasons set forth above, the allowance of this application is respectfully requested.

Respectfully submitted,



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The description has been amended as follows.

(1) Page 4, the paragraph beginning on line 25 has been amended as follows:

A piston cylinder 34 is carried by the tubular portion 22 and is formed with a very small diameter passageway which snugly receives a piston [rod] 36 in the form of a wire. The wire is secured to the lower end of the plunger 16 for movement therewith. The wire 36 is formed of a stainless steel, or of other suitable material. The piston [36] cylinder 34 may be formed of stainless steel or other suitable material.

(2) Page 4, the paragraph beginning on line 32 has been amended as follows:

Mounted on the lower end of the piston [36] cylinder 34, which extends beyond the tubular portion 22, is a receiver 38. The receiver 38 has an upper cylindrical portion 38.1 and a lower cone or funnel shaped portion 38.2 which acts as a female tip receiver of the suction device, and which snugly receives the male disposable pipette tip 14.

(3) Page 6, the paragraph beginning on line 1 has been amended as follows:

The pipette assembly of FIG. 5 also includes a disposable pipette tip 14 and a pipette body or suction device. The disposable pipette tip 14 is of the same construction as that shown in FIGS. 1-4 and described above. The suction device of this embodiment is functionally the same as the suction device 12 of the first embodiment, but is of a somewhat differing construction. Thus, in FIG. 1 a pipette body is illustrated which is formed principally of plastic parts, with the principal exceptions of the spring 30 and the wire 36 which forms the piston [rod]. However, in the device shown in FIGS. 5-7 the suction device, which is indicated generally at 52, is formed of a number

of stainless steel parts. Thus the principal component is a stainless steel cylindrical barrel 54 which has press fit into one end a cylindrical member 56. The member 56 has a bore which slidably receives a cylindrical plunger 58 which has a cylindrical surface. The plunger carries another cylindrical member 60 which is press fit about the plunger, the cylindrical member 60 having an exterior cylindrical surface which is slidably received within the cylindrical bore of the barrel 54. A spring 62 is disposed between the two cylindrical members 56 and 60, and as can be seen from an inspection of FIG. 5, when the plunger 58 is moved in the direction of arrow 64, the spring will be compressed. To this end the plunger is provided with a button end 66, and the barrel 54 is provided with a threaded end which receives threaded guide 68. While not illustrated, it should be apparent that the threaded guide 68 may be of differing lengths to control maximum movement of the plunger 58. In addition, other methods may be employed for controlling maximum movement of the plunger, for example placing shims between the button end and the guide 68.

(b) Page 7, the paragraph beginning on line 13 has been amended as follows:

A piston, [rod] in the form of a stainless steel wire 80, is carried at one end by the plunger 58. The other end of the wire 80 is closely received by the polyethylene tube 76 for sliding movement therein. Thus, the tube 76 acts as a cylinder and the wire 80 acts as a piston within the cylinder 76.